

REMARKS

Claims 22-51 were pending. By this Amendment, claims 22, 25, 43-46, and 48-51 are amended, claim 24 is canceled, and new claims 52-56 are added. Reconsideration and allowance of pending claims 22, 23, and 25-56 are respectfully requested in view of the following remarks and enclosed declarations.

**BANKS (U.S. Patent No. 4,045,253)**

Claims 22-51 were rejected under 35 U.S.C. § 102(b) as anticipated by Banks (U.S. Pat. No. 4,045,253). Applicants respectfully traverse these rejections for the following reasons.

Claim 22: Banks

Applicants traverse this rejection as applied to amended claim 22. Banks discloses a two step method whereby ferrous metal surfaces are first cleaned using a conventional chemical cleaning process to remove all accessible deposits, and then the cleaned ferrous metal surfaces are passivated. *See, e.g.*, Banks, col. 1, lines 7-9 (“passivating freshly cleaned ferrous metal surfaces”). This process does not anticipate or render obvious amended claim 22.

In Banks’ first step, the conventional chemical cleaning process is used to remove the scale and deposits from the ferrous surfaces before the passivating process can begin. *See* Banks, col. 1, lines 22-55. There is no disclosure or suggestion in Banks that such conventional chemical cleaning process utilizes an aqueous cleaning solution with “the chelant being present in the aqueous cleaning solution at a treatment concentration of less than about 1 weight percent,” as recited in claim 22.

In Banks’ second step, a passivating solution is applied to “freshly cleaned ferrous metal surfaces” so that the passivating solution can interact directly with the surface of the ferrous metal to passivate the metal. *See, e.g.*, Banks, col. 1, lines 8-9 (“passivating freshly cleaned ferrous metal surfaces”); *id.* at col. 3, lines 41-44 (“The passivating solution of our invention is maintained in contact with the acid-treated surface for a time sufficient to neutralize as well as passivate the acid-cleaned surface”). Indeed, the passivating process depends on the absence of scale and deposits on the surface of the ferrous metal. Accordingly, Banks does not disclose or suggest, among other things, that “the free span tube surfaces have scale and deposits accumulated thereon when the aqueous solution is provided in the heat exchange system.” Applicants therefore respectfully request the withdrawal of

this anticipation rejection of claim 22, as well as its dependent claims, which are allowable at least because they depend from an allowable independent claim.

Claims 52 and 54: Banks

New claims 52 and 54 further distinguish one or more embodiments of the present invention from Banks. Claim 52 recites, among other things, that “no cleaning techniques are used to remove scale and deposits from free span tube surfaces between the taking of the heat exchange system out of service and the providing in the heat exchange system of the aqueous solution.” Claim 54 recites, among other things, the “no cleaning techniques are used to remove scale and deposits from the secondary side of the nuclear steam generator between the taking of the heat exchange system out of service and the providing in the heat exchange system of the aqueous solution.” In contrast, Banks teaches that conventional chemical cleaning processes are used to remove scale and deposits from heat exchanger surfaces before the passivating solution is ever provided into the heat exchanger. Because this chemical cleaning is an important precursor to the passivating process, it would not have been obvious to omit such a pre-cleaning step from Banks’ disclosure. Indeed, Banks teaches away from such a modification to Banks’ disclosed method. Accordingly, Banks does not anticipate or render obvious dependent claims 52 or 54.

Claim 35: Banks

Applicants also specifically traverse this rejection with respect to dependent claim 35. Claim 35 recites, among other things, “maintaining the aqueous cleaning solution at a treatment temperature of less than 100°C during the treatment period.” In contrast, Banks discloses that “[a] preferred temperature range is from about 220°F to about 400°F.” Banks, col. 3, lines 30-31. In view of Banks’ teaching of a preferred higher temperature, it would not have been obvious to reduce the treatment temperature to “less than 100°C,” as recited in claim 35. Indeed, Banks teaches away from such a reduction in treatment temperature. Applicants therefore respectfully request the withdrawal of this anticipation rejection of claim 35 for this additional reason.

Claims 44, 48, and 50: Banks

Applicants also specifically traverse this rejection with respect to dependent claims 44 and 48 and independent claim 50. Claims 44, 48, and 50 recite, among other things, “increasing a porosity ... of deposits in the heat exchange system.” In contrast, Banks’ first step is designed to remove all scale and deposits from the heat exchange system so that the passivating solution can directly interact with the ferrous metal surfaces. There is no

disclosure that the conventional chemical cleaning processes used in Banks' first step increase a porosity of the deposits, especially in view of the fact that conventional cleaning processes use higher cleaning solution concentrations that completely remove the surface scale and deposits from heat transfer surfaces. Second, at the time Banks' lower concentration passivating solution is introduced into the heat exchange system, the scale and deposits have been removed, thereby making it impossible to increase their porosity. Applicants therefore respectfully request the withdrawal of this anticipation rejection of claims 44, 48, and 50.

Claims 43 and 46: Banks

Applicants also specifically traverse this rejection with respect to dependent claim 43 and independent claim 46. Claim 46 recites, among other things, "between taking the heat exchange system out of service and returning the heat exchange system to service, inducing corrosion of less than 0.001 inch in carbon and low alloy steels." Dependent claim 43 similarly recites, among other things, that "the method induces corrosion of less than 0.001 inch per application in carbon and low alloy steels between taking the heat exchange system out of service and returning the heat exchange system to service." In contrast, the conventional chemical cleaning techniques such as those disclosed in Banks result in much higher corrosion, and Banks' passivating step further corrodes the ferrous metal surface. *See* Varrin Decl., ¶ 4 ("actual corrosion ... ranged from 0.002 to 0.005 inch, which is typical for conventional chemical cleaning processes"); *see also* Application, ¶ [0015] ("Typically, the limiting per application corrosion rate for the chemical cleaning of nuclear steam generators is in the range of 0.002 to 0.003 inch, and the maximum number of cleaning applications that may be performed at the limiting corrosion rate is three."). Accordingly, Banks does not disclose or render obvious such low corrosion recited in claims 43 and 46. Applicants therefore respectfully request the withdrawal of the anticipation rejection of claims 43 and 46, as well as their respective dependent claims.

**MCINTYRE (U.S. Patent No. 4,578,162)**

Claims 22-51 were rejected under 35 U.S.C. § 102(b) as anticipated by McIntyre (U.S. Pat. No. 4,578,162). Applicants respectfully traverse these rejections for the following reasons.

Claims 22, 46, 50, and 51: McIntyre

Claim 22 is amended to incorporate the subject matter of dependent claim 24. Claims 46, 50, and 51 are similarly amended. Amended claims 22, 46, 50, and 51 each recite, among other things, that “the scale conditioning agent comprising a chelant and a reducing agent.” In contrast, while McIntyre discloses oxidizing agents, McIntyre does not disclose the combined use of a reducing agent and a chelant in a solution. Moreover, it would not have been obvious, and in fact would have been contrary to McIntyre’s cleaning objective, to add a reducing agent to McIntyre’s aqueous solution because these solutions are designed to dissolve metallic copper which requires strongly oxidizing conditions. Applicants therefore respectfully request the withdrawal of this anticipation rejection of claims 22, 46, 50, and 51, as well as their respective dependent claims.

Claims 44, 48, and 50: McIntyre

Claims 44, 48, and 50 each recite, among other things, “increasing a porosity of an iron oxide portion of deposits in the heat exchange system.” As explained in paragraph [0013] of the present application, the chelant “not only reacts at the surface of the deposit, but also penetrates below the surface to increase porosity within the deposit and promote laminar dissolution of the magnetite [iron oxide].” In contrast, McIntyre focuses on the removal of copper, rather than iron oxide, and therefore does not disclose or render obvious such a combination of recitations.

Claim 55: McIntyre

New dependent claim 55 further distinguishes one or more embodiments of the present invention from McIntyre. New claim 55 recites, among other things, “chelating and removing iron oxide deposits from within the heat exchange system.” In contrast, the cleaning solution disclosed in McIntyre selectively dissolves only copper due to the presence of the oxidizing agent, but does not chelate iron. McIntyre does mention that the oxidant solution used to remove copper may be used in conjunction with conventional chemical cleaning processes to completely remove both iron and copper deposits, which further confirms that the oxidant solutions discussed by McIntyre do not chelate iron. *See* McIntyre, col. 2, lines 34-39; *id.* at col. 4, lines 39-46 (“Optionally, more than one type of solution may be used in the method of the present invention. A first solution may be formulated to remove one metal, while a second solution may be formulated to remove a second metal. One solution may be an oxidizing solution, while the other may be a reducing solution. For example, an oxidizing solution may be used to remove the copper, and a reducing solution

may be used to remove the iron. The different solutions may be contacted with the copper-iron mixture in any sequential combination to most efficiently dissolve the copper and the iron. Preferably, the equipment is rinsed between solutions.”). Consequently, McIntyre does not anticipate claim 55 for this additional reason.

**BAUM ‘705 (U.S. Patent No. 4,632,705) and BAUM ‘657 (U.S. Patent No. 5,602,657)**

Claims 22-51 were rejected under 35 U.S.C. § 102(b) as anticipated by Baum ‘657 (U.S. Pat. No. 5,602,657) and Baum ‘705 (U.S. Pat. No. 4,632,705). Applicants respectfully traverse these rejections for the following reasons.

**Claim 22: Baum ‘705**

Claim 22 recites, among other things, “chelant being present in the aqueous cleaning solution at a treatment concentration of less than about 1 weight percent,” wherein “the free span tube surfaces have scale and deposits accumulated thereon when the aqueous solution is provided in the heat exchange system.” In contrast, the low concentration solution (i.e., 2-20% of previous recommendations) (Baum ‘705, col. 5, line 8) disclosed in Baum ‘705 was only intended to be used after all accessible deposits (e.g., tube scale) had already been removed in an earlier cleaning process. *See* Baum Decl. (attached hereto), ¶ 3 (“The use of ‘[b]ulk concentration [of an organic acid such as EDTA] between 2-20% of previous recommendations’ as stated in Baum ‘705 was intended only after all accessible deposits (e.g., tube scale) had already been removed in a preceding cleaning process”); *see also* Varrin Decl., ¶ 3 (“Upon reading Baum ‘705, I understood these quotes passages to refer to a process wherein all accessible deposits (e.g., tube scale) had already been removed in a preceding cleaning process.”). Indeed, “[i]f the Baum ‘705 process were applied to a steam generator that had not been previously cleaned to remove all accessible deposits from the free tube surfaces, it would be ineffectual for the cleaning of restricted areas such as crevices as Baum intended, because the EDTA would be rapidly consumed by the bulk deposits on the tubes.” Varrin Decl., ¶ 3; *see also* Baum Decl. (attached hereto), ¶ 3 (same). Consequently, Baum ‘705 does not disclose, and is in fact antithetical to, a combination of recitations wherein “the free span tube surfaces have scale and deposits accumulated thereon when the aqueous solution is provided in the heat exchange system,” as recited in claim 22. Applicants therefore respectfully request the withdrawal of the Baum ‘705 based anticipation rejection of claim 22, as well as its dependent claims, which are allowable at least because they depend from an allowable independent claim.

Claim 22: Baum '657

Claim 22 recites, among other things, “chelant being present in the aqueous cleaning solution at a treatment concentration of less than about 1 weight percent.” In contrast, Baum '657 discloses concentrations of “approximately 2% to 10% by weight... preferably from approximately 5% to 8% by weight.” Baum '657, col. 3, lines 13-15. Baum '657 also discloses a concentration of “25-200 grams/liter or more,” i.e., 2.5-20%. Baum '657, col. 5, lines 3-4 (emphasis added). This Baum '657 concentration is not “less than about 1 weight percent,” as recited in claim 22. Moreover, it would have been nonobvious under conventional wisdom to reduce the Baum '657 concentration because such a concentration reduction would have apparently impeded the very goal of the cleaning solution, i.e., completely dissolving all accessible scale and deposits. Moreover, absent the Applicants' disclosure in the present application of the non-obvious advantages of reduced chelant concentration according to one or more embodiments of the present invention, there was no reason for one of ordinary skill in the art to reduce the chelant concentration to below about 1 weight percent. Applicants further submit that none of these prior art references pursued lower chelant concentrations (i.e., “less than about 1 weight percent”) because the conventional objective of these prior art techniques had been to completely remove existing scale and deposits, rather than to increase the porosity/heat transfer properties of these deposits. Applicants therefore respectfully request the withdrawal of the Baum '657 based anticipation rejection of claim 22, as well as its dependent claims.

Claims 43 and 46: Baum '705 and Baum '657

Applicants also specifically traverse this rejection with respect to dependent claim 43 and independent claim 46. Claim 46 recites, among other things, “between taking the heat exchange system out of service and returning the heat exchange system to service, inducing corrosion of less than 0.001 inch in carbon and low alloy steels.” Dependent claim 43 similarly recites, among other things, that “the method induces corrosion of less than 0.001 inch per application in carbon and low alloy steels between taking the heat exchange system out of service and returning the heat exchange system to service.” In contrast, the conventional chemical cleaning techniques disclosed in Baum '705 and Baum '657 result in much higher corrosion. *See* Varrin Decl., ¶ 4 (“actual corrosion ... ranged from 0.002 to 0.005 inch, which is typical for conventional chemical cleaning processes”); *see also* Application, ¶ [0015] (“Typically, the limiting per application corrosion rate for the chemical cleaning of nuclear steam generators is in the range of 0.002 to 0.003 inch, and the maximum

number of cleaning applications that may be performed at the limiting corrosion rate is three.”). With respect to Baum ‘705, multiple cleaning solutions are used, thereby amplifying the amount of corrosion that occurs between taking the heat exchange system out of service and returning the heat exchange system to service. *See* Baum Decl. (attached hereto), ¶ 3 (The lower concentration solution disclosed in Baum ‘705 “was intended only after all accessible deposits (e.g., tube scale) had already been removed in a preceding cleaning process”); *see also* Varrin Decl., ¶ 3 (“Upon reading Baum ‘705, I understood these quotes passages to refer to a process wherein all accessible deposits (e.g., tube scale) had already been removed in a preceding cleaning process.”). Accordingly, Baum ‘705 and ‘657 do not disclose or render obvious the low corrosion recited in claims 43 and 46. Applicants therefore respectfully request the withdrawal of these anticipation rejections of claims 43 and 46, as well as their respective dependent claims.

Claims 44, 48, and 50: Baum ‘705 and Baum ‘657

Applicants also specifically traverse this rejection with respect to dependent claims 44 and 48 and independent claim 50. Claims 44, 48, and 50 recite, among other things, “increasing a porosity ... of deposits in the heat exchange system.” Baum ‘705 and ‘657 do not disclose such a combination of recitations. Indeed, Baum ‘657’s disclosed removal of “the majority of the sludge and surface deposits... from the heat exchanger” appears to be antithetical to the increased porosity recited in claims 44 and 48. Baum ‘657, col. 3, lines 56-57. Similarly, Baum ‘705’s disclosure of maintaining the cleaning solution “for a period of time sufficient to substantially fully solubilize the deposits” is likewise contrary to increasing the porosity of such deposits. Baum ‘705, col. 6, lines 6-7. This point is further demonstrated in the attached declarations. *See* Varrin Decl., ¶ 5 (“Since conventional cleaning processes such as those described in U.S. Patent Number 5,601,657 (“Baum ‘657”) and U.S. Patent Number 4,632,705 (“Baum ‘705”) target complete removal of tube scale and deposits, the increased porosity and associated benefits are not possible.”); *see also* Baum Decl., ¶ 3 (The lower concentration solution disclosed in Baum ‘705 “was intended only after all accessible deposits (e.g., tube scale) had already been removed in a preceding cleaning process”). Applicants therefore respectfully request the withdrawal of these anticipation rejections of claims 44, 48, and 50.

The lack of anticipation and non-obviousness of this increased porosity is also demonstrated by the industry’s reaction to the invention claimed in claims 44, 48, and 50. The claimed increased porosity advantageously improves heat transfer within the heat

exchange system, which advantageously decreases fouling and increases steam pressure. *See* Varrin Decl., ¶ 5 (“The chelant concentration of less than about 1% by weight in the aqueous cleaning solution, when combined with other appropriate chemical additives and under appropriate conditions according to one or more embodiments of the present invention, causes the chelant to not only react at the surface of the tube scale and deposits, but also penetrate below the surface to increase porosity within the deposits. If the deposits are present on a majority of heat transfer surfaces in the heat exchanger, the increased porosity advantageously improves heat transfer within the heat exchange system, which advantageously decreases fouling and increases steam pressure.”). As explained in paragraph 5 of the attached Varrin declaration:

The industry has been surprised and impressed with the improved heat transfer and the increased porosity that cleaning methods using chelant concentrations of less than about 1% by weight have obtained, and leading chemical cleaning experts in the U.S., Canada, France, Japan, and Korea have repeatedly expressed their compliments on the success of the scale conditioning treatment method. License agreements have already been executed between our assignee and a major corporation in Japan, and negotiations are in progress in France, Canada, and Korea.

Applicants therefore respectfully request the withdrawal of these anticipation rejections of claims 44, 48, and 50, as well as their respective dependent claims.

Claim 53: Baum ‘705 and Baum ‘657

New claim 53 further distinguishes one or more embodiments of the present invention from Baum ‘705 and Baum ‘657. New claim 53 recites, among other things, that “increasing the porosity comprises increasing the porosity of the iron oxide portion of deposits on free span tube surfaces of a secondary side of the heat exchange system.” Baum ‘705 and Baum ‘657 do not disclose or render obvious the combination of recitations in new claim 53.

Claim 56: Baum ‘705

New claim 56 further distinguishes one or more embodiments of the present invention from Baum ‘705. Claim 56 recites, among other things, “maintaining the treatment concentration at a uniform level between providing the aqueous cleaning solution in the heat exchanger and removing substantially all of the aqueous cleaning solution.” In contrast, the process in Baum ‘705 relies on boiling and venting of the aqueous cleaning solution in order to concentrate the organic acid in restricted areas and also to increase the bulk concentration of the organic acid over the course of the cleaning process. *See* Baum ‘705, col. 5, lines 56-65.



**ROOTHAM (U.S. Patent No. 5,764,717)**

Claims 22-51 were rejected under 35 U.S.C. § 102(b) as anticipated by Rootham (U.S. Pat. No. 5,764,717). Applicants respectfully traverse his rejection for the following reasons.

**All Independent Claims: Rootham**

Claims 22, 46, 50, and 51 each recite, among other things, “an aqueous cleaning solution of a scale conditioning agent, the scale conditioning agent comprising a chelant.” In contrast, the cleaning agent in Rootham comprises an intercalation agent, not a chelant. *See* Rootham, col. 11, lines 13-30. The differences between intercalation agents and chelants are discussed in detail in Varrin Decl., ¶ 7. Indeed, Rootham explicitly teaches away from the use of such chelate-containing solvents. *See* Rootham, col. 2, line 43, through col. 3, line 37. Consequently, Rootham does not disclose or render obvious a combination including, among other things, “an aqueous cleaning solution of a scale conditioning agent, the scale conditioning agent comprising a chelant,” as recited in claims 22, 46, 50, and 51. Applicants therefore respectfully request the withdrawal of this anticipation rejection of claims 22, 46, 50, and 51, as well as their respective dependent claims.

**Claim 22: Rootham**

Applicants also specifically traverse this rejection with respect to claim 22 for an additional reason. Claim 22 recites, among other things, “an aqueous cleaning solution of a scale conditioning agent, the scale conditioning agent comprising a chelant and a reducing agent, the chelant being present in the aqueous cleaning solution at a treatment concentration of less than about 1 weight percent.” Rootham’s discussion of chelants is in the context of the prior art is unrelated to the intercalation-based cleaning solution that Rootham discloses as having a concentration of less than 1%. *Compare* Rootham, col. 11, lines 13-31 (discussing intercalation agents having a concentration of less than 0.5 weight percent), *with* Rootham, col. 2, lines 34-52 (discussing conventional “chelate-containing” solvents). Rootham does not disclose or render obvious an aqueous cleaning solution comprising a chelant, “the chelant being present in the aqueous cleaning solution at a treatment concentration of less than about 1 weight percent,” as recited in claim 22. Applicants therefore respectfully request the withdrawal of this anticipation rejection of claim 22, as well as its respective dependent claims, for this additional reason.

Claims 43 and 46: Rootham

Applicants also specifically traverse this rejection with respect to claims 43 and 46 for an additional reason. Claim 46 recites, among other things, “between taking the heat exchange system out of service and returning the heat exchange system to service, inducing corrosion of less than 0.001 inch in carbon and low alloy steels.” Dependent claim 43 similarly recites, among other things, that “the method induces corrosion of less than 0.001 inch per application in carbon and low alloy steels between taking the heat exchange system out of service and returning the heat exchange system to service.” In contrast, Rootham recognizes that conventional chelate-based cleaning solutions “promot[e] new corrosion within the steam generator ... particularly among the carbon steel and low alloy steel components of the generator,” and “induce a significant amount of new corrosion on the metallic components of the generator.” Rootham, col. 2, lines 56-64. Consequently, Rootham does not disclose that such conventional chelate-based cleaning solutions “induce[] corrosion of less than 0.001 inch” in carbon and low alloy steels, as recited in claims 43 and 46. Applicants therefore respectfully request the withdrawal of this anticipation rejection of claims 43 and 46, as well as their respective dependent claims, for this additional reason.

Claims 44, 48, and 50: Rootham

Applicants also specifically traverse this rejection with respect to dependent claims 44 and 48 and independent claim 50. Claims 44, 48, and 50 recite, among other things, “increasing a porosity ... of deposits in the heat exchange system.” Rootham does not disclose that the conventional chelate-based cleaning solutions or the intercalation-based cleaning solution increase the porosity of the deposits in the heat exchange system. Indeed, intercalation agents are significantly different from chelant agents, and intercalation agents would not be expected to increase the porosity of the deposits. *See Varrin Decl.*, ¶ 7. Applicants therefore respectfully request the withdrawal of the anticipation rejections of claims 44, 48, and 50 for this additional reason.

Claim 55: Rootham

New dependent claim 55 further distinguishes one or more embodiments of the present invention from Rootham. New claim 55 recites, among other things, “chelating and removing iron oxide deposits from within the heat exchange system.” In contrast, the intercalation agents used in Rootham were intended “to insert and remove themselves from the crystalline structure of deposit species (primarily silicates), resulting in a ‘swelling’ of

chemical bonds and disruption of the overall deposit structure,” but these intercalation agents do not chelate and remove iron oxide deposits. *See* Varrin Decl., ¶ 7.

### **CLAIMS 45, 49, AND 51**

Claims 45, 49, and 51 were rejected under 35 U.S.C. § 102 as anticipated by each of Banks, McIntyre, Baum ‘705, Baum ‘657, and Rootham. Applicants specifically traverse these rejections as applied to amended dependent claims 45 and 49 and amended independent claim 51. Amended claims 45 and 49 recite, among other things, that “the heat exchange system forms part of a secondary side of a nuclear steam generator,” and “the method further comprises releasing the used aqueous cleaning solution into the environment as conventional industrial waste, rather than radioactive waste.” Claim 51 recites, among other things, “a heat exchange system that forms part of a secondary side of a nuclear steam generator,” and “releasing the used aqueous cleaning solution into the environment as conventional industrial waste, rather than radioactive waste.” None of the references cited by the Examiner disclose such a combination of recitations. Instead of citing any prior art, the Examiner merely “takes official notice that nuclear dumping of waste has been known since the beginning of the study of radioactive isotopes. In fact, Madame Curie (~1910) probably dumped nuclear waste down the sink in her lab.” 9/5/06 Office Action, pp. 4-5. While potentially true, Madam Curie never disposed of a “used aqueous cleaning solution” that had been used to remove scale and depositions within a heat exchange system that “forms part of a secondary side of a nuclear steam generator.” To the contrary, strict regulations currently prohibit radioactive used cleaning solutions from being released into the environment if the presence of gamma-emitting radionuclides can be detected. *See* Varrin Decl., ¶ 9 (“the limit for detection for gamma-emitting radionuclides such as Co-60, Co-58, or Cs-137 is on the order of  $1 \times 10^{-8}$   $\mu\text{Ci}$  per milliliter using standard analytical equipment. Any cleaning solutions in which radioactivity can be detected are classified as radioactive waste and must be processed accordingly.”). Conventional chelant-based cleaning solutions resulted in radioactive used cleaning solutions that could not be released into the environment, and instead were extremely expensive to dispose of. *See* Varrin Decl., ¶ 9 (“Given that waste treatment costs range from \$10-30/gallon for used cleaning solutions classified as radioactive, and that waste volumes may be more than 100,000 gallons per application in a nuclear steam generator chemical cleaning, the savings associated with avoiding the generation of radioactive waste can be substantial”). In contrast, one or more embodiments of the present invention result in

used cleaning solutions that are non-radioactive and can be released into the environment as conventional industrial waste, rather than radioactive waste, which significantly reduces waste disposal costs. *See* Varrin Decl., ¶ 9 (“For comparison, disposal costs for non-radioactive liquid waste generated during a scale conditioning agent treatment ... typically range from \$0.5-1.0/gallon.”). Rootham likewise acknowledges that conventional chelate-based cleaning solutions resulted in “radioactive liquid waste.” Rootham, col. 3, line 17. The commercial and financial significance of the ability of one or more embodiments of the present invention to prevent the generation of radioactive liquid waste should not be underestimated or ignored. Applicants therefore respectfully request the withdrawal of these anticipation rejections of claims 45, 49, and 51, as well as their respective dependent claims.

### CONCLUSION

All objections and rejections having been addressed, it is respectfully submitted that the present application is in condition for allowance, and a Notice to that effect is requested.

If the Examiner has any questions or suggestions that will further prosecution of this application, the Examiner is encouraged to contact the undersigned at the below-listed telephone number.

Please charge any fees associated with the submission of this paper to Deposit Account Number 033975. The Commissioner for Patents is also authorized to credit any over payments to the above-referenced Deposit Account.

Respectfully submitted,

PILLSBURY WINTHROP SHAW PITTMAN LLP



BENJAMIN L. KIERSZ  
Reg. No. 51875  
Tel. No. 703 770.7714  
Fax No. 703 770.7901

Date: July 5, 2007  
P.O. Box 10500  
McLean, VA 22102  
(703) 770-7900

Enclosures: Varrin Declaration  
Baum Declaration